

SEQUENCE LISTING

<110> Choi, Eui-Sung
Rhee, Sang-Ki
Sohn, Jung-Hoon
Park, Soo-Dong
Lee, Yoon-Hyoung
Lee, Seung-Jae
Jang, Jae-Kweon
Choi, Seok-Keun
Son, Young-Rok

<120> VECTOR FOR THE TRANSFORMATION OF PHAFFIA
RHODOZYMA AND PROCESS OF TRANSFORMATION THEREBY

<130> 118.12-US-WO

<140> 09/830,691

<141> 2001-04-26

<150> KR 1998/46547

<151> 1998-10-31

<150> PCT/KR99/00265

<151> 1999-05-29

<160> 20

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 1223

<212> DNA

<213> Phaffia rhodozyma

<400> 1

```
atgggtcaacg ttcccaagac tcgacgtgag ttatagcaat ttcaacaact ctccagacga 60
caaatattcc agtgcacgaa aagagtttgt ggataaacgc gacagtttca agggaaagag 120
tcgatggaca gatttggaag acttagccgg tcaaggaaact tggggatcac gtggcggagg 180
actcatcaga agaagtcggg atttgtttga tcatagtggg atcaagacaa actggaggat 240
atggctcgcc ttggaagggg atctccggcc tggattcgag gatccgaaag ttgtacgtat 300
ggaaaagctt acacggcttg gatttattat ctttcatagg aacctactgc aagggttaagg 360
cttgcaagaa gcacacgtaa gtcgcttatt ctctccactc tttcatggca tattgtcaac 420
gactggacaa cgcgtccgtt ttgaaacaag tgacttacct gtgaaatttg attctacacc 480
tgtatttagc cctcacaagg tacatatcac atcctccac cccaccctgc ccaacttctt 540
cagttcatct tgctctcggt ttccacattc cctgatgacc tccttgtagt ttctttgcga 600
acgttttgtt ctgtttctgt aggtgaccca gtacaagaag ggaaaggact ccatcttcgc 660
ccagggaaag cgcgatacgc accgaaagca gtccgggttac ggaggtcaga ccaagcccg 720
tttccacaag aaggctaaga ccaccaagaa ggtcgctcct cgattggcgg tatttttggt 780
tattttgaat tctttttgtg tatgcagact tttgatgatt atgctcctct gtcgtttttt 840
ctcttcaaac agagtgtcc gtctgcagtt cgttcttctt tccaaccaa acttcaacta 900
cagacatcat aaacagacat cttacttcgg tggtctctct ttttttcgc agagtacaag 960
atgcagatga ccctcaagcg atgcaagcac ttcgagcttg gaggagacaa gaagaccaag 1020
ggttcgtctt ttgtccatat attctctggt tcaactctta tgttcctaac gtacttggtt 1080
cctttttggt tcggatgttg tttctatcgg tggtgttttc tttcttttg atgcattatc 1140
```

atttatcgtg ttggactgtt ttctctgtct cgtttctttc tcctctgtac ttgtgcttct 1200
caggagccgc catctctttc taa 1223

<210> 2
<211> 350
<212> DNA
<213> Phaffia rhodozyma

<220>
<221> CDS
<222> (30)...(347)

<400> 2
cccttcaagt ctcgtctcaa tcagtcaag atg gtc aac gtt ccc aag act cga 53
Met Val Asn Val Pro Lys Thr Arg
1 5

cga acc tac tgc aag ggt aag gct tgc aag aag cac acc cct cac aag 101
Arg Thr Tyr Cys Lys Gly Lys Ala Cys Lys Lys His Thr Pro His Lys
10 15 20

gtg acc cag tac aag aag gga aag gac tcc atc ttc gcc cag gga aag 149
Val Thr Gln Tyr Lys Lys Gly Lys Asp Ser Ile Phe Ala Gln Gly Lys
25 30 35 40

cga cga tac gac cga aag cag tcc ggt tac gga ggt cag acc aag ccc 197
Arg Arg Tyr Asp Arg Lys Gln Ser Gly Tyr Gly Gly Gln Thr Lys Pro
45 50 55

gtt ttc cac aag aag gct aag acc acc aag aag gtc gtc ctt cga ttg 245
Val Phe His Lys Lys Ala Lys Thr Thr Lys Lys Val Val Leu Arg Leu
60 65 70

gag tgc tcc gtc tgc aag tac aag atg cag atg acc ctc aag cga tgc 293
Glu Cys Ser Val Cys Lys Tyr Lys Met Gln Met Thr Leu Lys Arg Cys
75 80 85

aag cac ttc gag ctt gga gga gac aag aag acc aag gga gcc gcc atc 341
Lys His Phe Glu Leu Gly Gly Asp Lys Lys Thr Lys Gly Ala Ala Ile
90 95 100

tct ttc taa 350
Ser Phe
105

<210> 3
<211> 106
<212> PRT
<213> Phaffia rhodozyma

<400> 3
Met Val Asn Val Pro Lys Thr Arg Arg Thr Tyr Cys Lys Gly Lys Ala
1 5 10 15
Cys Lys Lys His Thr Pro His Lys Val Thr Gln Tyr Lys Lys Gly Lys
20 25 30
Asp Ser Ile Phe Ala Gln Gly Lys Arg Arg Tyr Asp Arg Lys Gln Ser

	35					40						45							
Gly	Tyr	Gly	Gly	Gln	Thr	Lys	Pro	Val	Phe	His	Lys	Lys	Ala	Lys	Thr				
	50					55					60								
Thr	Lys	Lys	Val	Val	Leu	Arg	Leu	Glu	Cys	Ser	Val	Cys	Lys	Tyr	Lys				
65					70					75					80				
Met	Gln	Met	Thr	Leu	Lys	Arg	Cys	Lys	His	Phe	Glu	Leu	Gly	Gly	Asp				
				85					90					95					
Lys	Lys	Thr	Lys	Gly	Ala	Ala	Ile	Ser	Phe										
			100					105											

<210> 4
 <211> 741
 <212> DNA
 <213> Phaffia rhodozyma

<220>
 <221> misc_feature
 <222> (0)...(0)
 <223> n=a, t, c, or g

<400> 4
 ctcgagtgga cgggtggcaat ggcattcgtg tcgttggtgc tcactcgcaa cccaagcagt 60
 cgcttaccgc gggtagcctc cgggtgggcg cgatgatttg tgggtgtggat tccttcccta 120
 tgggtagaac gacgcgcaac caatcattcg gagaaccgct ccgttgtagc cgaccagtct 180
 gattgatcaa catgccagca cgtcctccgg gacggagact ggcggggatc gtacctcatc 240
 tggaatcgct ggctcaatgg tagtagtctt cacgatcggc catgagggca gtctaggtgg 300
 gttcgctgc cgaagactgt gtgagtgtgc tganaactaa ttgagtaccg ggggataagg 360
 caaggcgtgt ntggttgccg gtggctgtga gcgagtttgc tgcaaagcga ttcaatgcac 420
 cccggcttgg ccagcgcgct gcgtcacgaa acacactaaa cggttgacgc cataaagtaa 480
 taacacactc aagtttgtgg tcccgggtgg gcctctgtgc ctgctgtgga cccgacggga 540
 gaggaaaacg ttctgtggcc ctctcctctg tggatagtta cctgggtgat cctgccagta 600
 gtcatatgct tgtctcaaag attaagccat gcatgtctaa gtataaacia attcactatg 660
 tgaaactgcg aatggctcat taaatcagtt atagtttatt tgatggtacc ttgctacatg 720
 gataactgtg gtaattctag a 741

<210> 5
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> CYH1, a PCR primer for the cloning of L41 genomic
 DNA fragment

<221> misc_feature
 <222> (0)...(0)
 <223> n=a, t, c, or g

<400> 5
 cgcgtagtta aygtncnaa rac

23

<210> 6
 <211> 25
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> CYH3, a PCR primer for the cloning of L41 genomic
 DNA fragment

<400> 6
 cccgggtytt ggcyttyttr tgraa 25

<210> 7
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> 3' RACE primer

<400> 7
 ggtcagacca agcaagtttt tcac 24

<210> 8
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> 5' RACE primer

<400> 8
 gtgaaaaact tgcttggctc gacc 24

<210> 9
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> sense primer for the mutagenesis of L41 gene

<400> 9
 ggtcagacca agcaagtttt tcac 24

<210> 10
 <211> 24
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> antisense primer for the mutagenesis of L41 gene

<400> 10
 gtgaaaaact tgcttggctc gacc 24

<210> 11
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>

<223> a PCR primer corresponding to 18S rDNA

<400> 11

tcctagtaag cgcaagtcac

20

<210> 12

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> a PCR primer corresponding to 18S rDNA

<400> 12

ttcggccaag gaaagaaact

20

<210> 13

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> a PCR primer corresponding to 28S rDNA

<400> 13

aatcggatta tccggagcta

20

<210> 14

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> a PCR primer corresponding to 28S rDNA

<400> 14

gctataacac atccggagat

20

<210> 15

<211> 2192

<212> DNA

<213> Phaffia rhodozyma

<400> 15

aagagctatt tgaatgacga ccacaagagt gacgatcata ttgagcatag tataccaaaag 60
gccaagaggc tgtgtggtgt tctatgagtg gccttgatta tgtgttacat aaataaaactg 120
atctcaattt ttcaaatact tgccaacact ttcatatatt cacaccaaaa aaagtcagat 180
tggcccacaa agtcagatac acgctcgatc gtcgacgggt tcaagcactt tgtcaggcga 240
aagaaaggcc acagcaccac ccttcaagtc tcgtctcaat caggttcgtc tagctttttg 300
tgtgcaagga ttaccgtct tgatggattt gttcgttgaa agagaggaaa gaacatgctg 360
aactgacgaa agtgtgaaca aaaaattgtg attttttcat tgtgtttcgc tgggtctcctt 420
gctgggttgg gttggatcgg atttatcttc tgtgttggat ggaaaaccct gaatgttctt 480
ttcttggaca tcttctaaac tcgacaaaac gattcattcc tccgtactgc tctggttctg 540
cctttttgaa tcgcatcgat aaattcttcc ctcggaacgt tcgatcaatc tccgtcaaac 600
ttatcatcca aaaatctctt ctcgactgcc gccttgctcc ttttcttctg tctttcotta 660
atccgctttc gactaccctc cttctcttca cactcatagt caagatggtc aacgttccca 720
agactcgacg tgagttatag caatttcaac aactctccag acgacaaata ttccagtgc 780

```

tcgaaagagt ttgtggataa acgcgacagt ttcaagggaa agagtcgatg gacagatttg 840
gaagacttag ccggtcaagg aacttgggga tcacgtggcg gaggactcat cagaagaagt 900
cgggatttgt ttgatcatag tgggatcaag acaaactgga ggatatggct cgccttggaa 960
gggaatctcc ggcctggatt cgaggatccg aaagtgttac gtatggaaaa gcttacacgg 1020
cttggattta ttatctttca taggaaccta ctgcaagggt aaggcttgca agaagcacac 1080
gtaagtcgct tatctctccc actctttcat ggcatattgt caacgactgg acaacgcgctc 1140
cgttttgaaa caagtgactt acctgtgaaa ttgtattcta cacctgtatt tagccctcac 1200
aagggtacata tcacatcctc ccaccccacc ctgcccactt tcttcagttc atcttgctct 1260
cggtttccac attccctgat gacctccttg tatgttcttt gcgaacgttt gtttctgttt 1320
ctgtaggatga ccagtagcaa gaagggaaa gactccatct tcgcccaggg aaagcgacga 1380
tacgaccgaa agcagtcagg ttacggaggt cagaccaagc ccgtttttca caagaaggct 1440
aagaccacca agaaggtcgt ccttcgattg ggtacgtttt tgtttatttt gaattctttt 1500
tgtgtatgca gacttttgat gattatgctc ctctgtcgtt ttttctcttc aaacagagtg 1560
ctccgtctgc agttcgttct tccttccaac caaaacttca actacagaca tcataaacag 1620
acatcttact tcggtgttct ctcttttttt ccgcagagta caagatgcag atgacctca 1680
agcgatgcaa gcacttcgag cttggaggag acaagaagac caagggttcg tcttttgctc 1740
atatattctc tggttcactt cttatgttcc taacgtactt gtttcctttt tggttcggat 1800
gttgtttcta tcggtggtgt tttcttttct ttggatgcat tatcatttat cgtgttggac 1860
tgttttctc tgctcgtttt tttctctct gtacttgtgc ttctcaggag ccgccatctc 1920
tttctaaaatg gttgttttaa ccccgctcgc tccaccatat gtcaaatcgg catgcgcgtt 1980
gtcccttcca atcagtcgtt tccatgctcg agatacttct tggacgttct tggggagcaa 2040
ttacacatcg agaaaatacc caaaaaacca cgcaccccct tttatttcaa tggggagatc 2100
tggatctatg tatcatgtcg attttctatt tcccaaaacc cattgattgt tcatctcctc 2160
ttaagagtaa catcttttcc aagatacttc tc 2192

```

<210> 16
 <211> 106
 <212> PRT
 <213> Phaffia rhodozyma

```

<400> 16
Met Val Asn Val Pro Lys Thr Arg Arg Thr Tyr Cys Lys Gly Lys Ala
1          5          10          15
Cys Lys Lys His Thr Pro His Lys Val Thr Gln Tyr Lys Lys Gly Lys
20          25          30
Asp Ser Ile Phe Ala Gln Gly Lys Arg Arg Tyr Asp Arg Lys Gln Ser
35          40          45
Gly Tyr Gly Gly Gln Thr Lys Pro Val Phe His Lys Lys Ala Lys Thr
50          55          60
Thr Lys Lys Val Val Leu Arg Leu Glu Cys Ser Val Cys Lys Tyr Lys
65          70          75          80
Met Gln Met Thr Leu Lys Arg Cys Lys His Phe Glu Leu Gly Gly Asp
85          90          95
Lys Lys Thr Lys Gly Ala Ala Ile Ser Phe
100          105

```

<210> 17
 <211> 18
 <212> DNA
 <213> Phaffia rhodozyma

```

<400> 17
accaagcccg tttttcac 18

```

<210> 18
 <211> 6

<212> PRT
<213> Phaffia rhodozyma

<400> 18
Thr Lys Pro Val Phe His
1 5

<210> 19
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> mutation

<400> 19
accaagcaag tttttcac

18

<210> 20
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> mutation

<400> 20
Thr Lys Gln Val Phe His
1 5